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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

MEMORANDUM

TO: Ruth Milkman

FROM: CTA Commercial Systems, Inc.
E-Sat, Inc.
Final Analysis Communications Services, Inc.
GE Starsys Global Positioning, Inc.
Orbital Communications Corp.
Volunteers in Technical Assistance

DATE: April 11, 1997

RE: IB Docket No. 96-220: NVNG MSS Industry Band Plan

The undersigned counsel submit this memorandum on behalf of the following second round applicants in the above referenced proceeding: CTA Commercial Systems, Inc. ("CTA"), E-Sat, Inc. ("E-Sat"), Final Analysis Communication Services, Inc. ("Final Analysis"), GE Starsys Global Positioning, Inc. ("GE Starsys"), Orbital Communications Corp. ("Orbcomm") and Volunteers in Technical Assistance ("VITA") (collectively the "Parties").

Attached hereto is a detailed technical description of the band plan proposed by the Parties for assignment of frequencies to all second round NVNG MSS applicants which: (i) includes frequency assignments for all of the second round applicants; (ii) protects existing licensees and users from harmful interference; (iii) promotes spectrum efficiency; and (iv) eliminates any potential mutual exclusivity. The Parties acknowledge that, for final coordination, some additional refinements may need to be made to the specific channel assignments set forth in this proposal, and agree to work out such refinements in good faith.

We believe that this proposal resolves the second round assignment issues in the manner most consistent with the public interest, as it will speed delivery of service to the public within a competitive industry structure. We also believe that, consistent with the provisions of Section 309 of the Communications Act of 1934, as amended, this engineering solution obviates any need for application of selection criteria, including auctions, that may otherwise be deemed necessary to resolve mutual exclusivity. Because this proposal has the support of six of the seven second round applicants, we believe that the Commission should adopt it, even if unanimous industry agreement is not achieved. Moreover, the Commission does not need to have unanimity on proposed rules in order to conclude that a fungible allocation is practical and in the public interest for many reasons. These include the fact that this proposal will not unfairly favor particular applicants, will maximize competitive entry and overall Little Leo development and will obviate mutual exclusivity and enable grants without a hearing.

We emphasize that the enclosed proposal represents an accommodation by the Parties to facilitate an expeditious resolution of this proceeding. If such a resolution is not forthcoming, each of the participating applicants reserves its rights to seek different frequency allocations, and/or systems of different sizes, than those suggested here. In addition, the Parties are accepting this proposal as an interim solution, and reserve all rights to seek any additional frequencies that may become available for NVNG MSS use as a result of the 1997 World Radio Conference.

We are anxious to bring this proceeding to a positive conclusion and welcome your further comments or questions on this proposal.

Respectfully submitted,

Phillip L. Spector
Diane C. Gaylor
Counsel for CTA

Peter A. Rohrbach
Counsel for GE Starsys

Leslie A. Taylor
Guy Christiansen
Counsel for E-Sat

Stephen L. Goodman
Counsel for Orbcomm

Aileen A. Pisciotta
Peter A. Batacan
Counsel for Final Analysis

Henry Goldberg
Joseph A. Godles
Counsel for VITA

Attachment

cc: William F. Caton
Harry Ng
Thomas Tycz
Cassandra Thomas
Julie Garcia
Paula Ford
William Hatch
Nelson Pollack
Richard Barth
Robert Mazer

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DC01/PISCA/38547.41

IB Docket No. 96-220

PARTIES' PROPOSAL

General Introduction

The proposed band plan includes assignments for all second round NVNG MSS applicants as specified below within the limits of the currently available spectrum and its resulting constraints on both first and second round parties. It is contemplated that all systems would be eligible for additional spectrum to reduce capacity constraints when such spectrum can be allocated and assigned.

Three different systems are identified for new applicants proposing to operate in the FDMA/TDMA mode: System Z is a small constellation, designed to accommodate CTA Commercial Systems, Inc. ("CTA"). Systems X and Y reflect two fungible assignments for two large constellations, presumed to be those proposed by Final Analysis Communication Services, Inc. ("Final Analysis") and Leo One USA Corporation ("Leo One"). No presumption is made as to which system (X or Y) ultimately will be assigned to either of the large constellation applicants.

For the one new applicant proposing to operate in the CDMA mode, E-Sat, Inc. ("E-Sat"), operating parameters and requirements for coordinating with existing licensees (GE Starsys and Orbcomm) are separately identified.

Coordination with Starsys will be required. In all cases new applicants (including Orbcomm) will operate in the NOAA Inner Channels in such a way that the aggregate interference caused by the simultaneous operation of channels allocated in the second round of NVNG MSS proceedings in the 137-138 MHz band will not degrade the Starsys link margin more than 1/3 (approximately .77 dB). This will require e.i.r.p. limits at the satellites for feeder link channels operating in the primary allocation area (137.175-137.825 MHz), and avoidance of transmissions when in the main beam of the Starsys ground station antennas, on a worldwide basis.

The band plan provides for certain modifications to assignments following anticipated NOAA migration from the "NOAA Inner Channels" to the "NOAA Outer Bands" in the 137-138 MHz band (in approximately 2002).

DOWNLINK

Introduction to Downlink Assignments

Downlink assignments for new NVNG MSS applicants are made in both the 137-138 MHz and 400-401 MHz bands. System Z operates exclusively in the 137-138 MHz band for both feeder links and service links. Systems X and Y are restricted to feeder links only in the 137-138 MHz band and service links and additional feeder links as required in the 400-401 MHz Band. Additional channel assignments are also identified for Orbcomm.

Assignments in the 137-138 MHz band include channels in NOAA bands as follows:

NOAA Outer Bands
137.025-137.175 and 137.825-138.0 MHz

NOAA Inner Channels (including guard bands)[1]
137.325-137.375, 137.4725-137.535, 137.585-137.6505, and 137.7405-137.8025 MHz

Proposals are made for different operating parameters in these bands both before and after NOAA migration to the outer bands in about 2002.

SYSTEM Z (CTA)

137-138 MHz Band

System Z (CTA) operates both feeder links and service links in the 137-138 MHz band, as specified below.

NOAA Outer Band Assignment

137.025-137.075 MHz
137.950-138.0 MHz

This allocation can be used for both feeder link and service link operations on a primary basis until launch of first EUMETSAT and/or first NOAA satellite using the NOAA Outer Band (about 2002). The allocation can then be used on a time shared basis with NOAA and EUMETSAT.

NOAA Inner Channels (including guard bands) Assignment

Allocations in these bands are for feeder links only:

137.325-137.340 MHz
137.7875-137.8025 MHz

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[1] Some of the assignments specified herein are in the guard bands of the NOAA Inner Channels. If for any reason the Commission should not permit use of any of these guard bands by Little LEO systems, or should restrict their use in any way that would limit Little LEO operation in any of these bands, the assignments of these four inner channels will be reallocated between the four (4) parties with the following order of priority of maintaining the initial size of the NOAA Inner Channel assignments for each of the parties: first - CTA, second - Orbcomm, third - System X and fourth - System Y.

Before NOAA Migration to Outer Band

This allocation would be time shared with NOAA satellites currently using the NOAA Inner Channels until the satellites are retired. Operations in these channels will not exceed the equivalent feeder link power (8 dBW @ 775 km altitude) per channel, and must be closely coordinated with Starsys as discussed above.

After NOAA Migration to Outer Band

The allocation can be used on a primary basis after the NOAA satellites using the NOAA Inner Channels are retired. At that time, Starsys would be permitted to increase its power by three dB. System Z, Starsys, and E-Sat would continue to coordinate their respective operations in these channels on the same terms as discussed above.

SYSTEM X

137-138 MHz BAND

System X can perform only feeder link operations in this band.

NOAA Outer Band Assignment

137.075-137.125 MHz
137.900-137.950 MHz

This allocation can be used for only feeder link operations (EIRP of 8 dBW or less at 775 km altitude). This band can be used until launch of first EUMETSAT and/or first NOAA satellite using the NOAA Outer Band (about 2002). The allocation can then be used on a time shared basis with NOAA and EUMETSAT.

NOAA Inner Channels (including guard bands) Assignment

137.585-137.6505 MHz

Before NOAA Migration to Outer Band

This allocation can be time shared with NOAA satellites currently using spectrum until the satellites are retired. Operations in this channel will not exceed the equivalent feeder link power (8 dBW @ 775 km altitude) per channel, and must be closely coordinated with Starsys as discussed above.

After NOAA Migration to Outer Band

The NOAA inner channels can be used on a primary basis after NOAA migration. Starsys

would be permitted to increase its power by three dB. Coordination with Starsys continues to be a requirement on the same terms.

400-401 MHz BAND

System X can use this band for service links and, perhaps, for additional feeder link operations. The use of this band is subject to time sharing and other necessary coordination with DMSP.

400.150-400.350 MHz and 400.645-400.845 MHz

SYSTEM Y

137-138 MHz BAND

System Y can perform only feeder link operations in this band.

NOAA Outer Band Assignment

137.125-137.175 MHz
137.850-137.900 MHz

This allocation can be used for only feeder link operations (with EIRP of 8 dBW or less at 775 km altitude). This band can be used until launch of first EUMETSAT and/or first NOAA satellite using the NOAA Outer Band (about 2002). The allocation can then be used on a time shared basis with NOAA and EUMETSAT.

NOAA Inner Channels (including guard bands) Assignment

137.4725-137.535 MHz

Before NOAA Migration to Outer Band

This allocation can be time shared with NOAA satellites currently using spectrum until the satellites are retired. Operations in this channel will not exceed the equivalent feeder link power (8 dBW @ 775 km altitude) per channel, and must be closely coordinated with Starsys as discussed above.

After NOAA Migration to Outer Band

The NOAA inner channels can be used on a primary basis after NOAA migration. Starsys would be permitted to increase its power by three dB. Coordination with Starsys continues to be a requirement on the same terms.

400-401 MHz BAND

System Y can use this band for service links and, perhaps, for additional feeder link operations. The use of this band is subject to time sharing and other necessary coordination with DMSP and VITA.

400.350-400.5517 MHz and 400.845-401.0 MHz

ORBCOMM

Orbcomm can use NOAA Inner Channels for feeder links as follow:

NOAA Inner Channels (including guard bands) Assignment

137.340-137.375 MHz
137.7405-137.7875 MHz

Before NOAA Migration to Outer Band

This allocation can be time shared with NOAA satellites currently using spectrum until the satellites are retired. Operations in these channels will not exceed the equivalent feeder link power (8 dBW @ 775 km altitude) per channel, and must be closely coordinated with Starsys as discussed above.

After NOAA Migration to Outer Band

The NOAA inner channels can be used on a primary basis. Starsys would be permitted to increase its power by three dB. Coordination with Starsys continues to be a requirement on the same terms.

E-SAT

E-Sat's proposed spectrum use and coordination plan is provided as Attachment A hereto.

UPLINK

Introduction to Uplink Assignments

Uplink assignments for new NVNG MSS applicants are made in the 149 MHz band. In addition, VITA's first round system will gain access to the full FDMA/TDMA portion of the 149 MHz band. For service links, the FDMA/TDMA systems will share the 148.905-149.900 MHz band, as specified below. For feeder links, uplink assignments permitting viable system operations are proposed for Systems, X, Y and Z in the 100 kHz of spectrum currently

available in the lower Transit band (149.95-150.05 MHz)[2]. However, as these assignments result in feeder link uplinks of less than 50 kHz, it is preferable to allocate additional uplink spectrum in this proceeding, in particular, the upper Transit Band (399.9-400.05 MHz), which is already allocated globally for NVNG services.

Service Links

CTA (System Z), System X, and System Y will operate in the 148.905-149.900 MHz band using DCAAS or similar technique. VITA also will operate in the 148.905-149.900 MHz band using DCAAS or similar technique.

Feeder Links

Without Allocation of Upper Transit Band

System Z (CTA): 149.950-149.975 MHz
System X: 149.975-150.0125 MHz
System Y: 150.0125-150.05 MHz

With Allocation of Upper Transit Band

Subject to the successful conclusion of an agreement with OHB of Germany allowing a U.S. Little Leo system to use 50 kHz of spectrum in the upper Transit band (399.900-400.05 MHz), System Z (CTA) will migrate to such 50 kHz, and System X and Y will split the 149.950-150.05 MHz available in the lower Transit band as follows:

System X: 149.950-150.00 MHz
System Y: 150.00-150.05 MHz

Allocation and Assignment of WRC-95 Bands

Several of the Parties have proposed that the Commission allocate and assign WRC-95 spectrum in the proceeding to help alleviate congestion in uplink bands. Specifically, the Parties propose that System X and Y each be assigned 200 kHz bands in either the 455-456 MHz band or the 459-460 MHz band as dedicated feeder links; and that System Z be assigned a 50 kHz band in either the 455-456 MHz band or the 459-460 MHz band as a dedicated feeder link. The remaining spectrum would be shared among the applicants on a coordinated basis for service links using the DCAAS or similar techniques.

In addition, the Parties anticipate that additional spectrum will be allocated at WRC-97 for NVNG feeder links, as well as for other NVNG spectrum requirements. To the extent that

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[2] The frequencies between 149.9 - 149.950 MHz are currently allocated to S-80, and are not addressed in this proposal.

such allocations occur, and the Commission makes those frequencies available for System X and/or System Y feeder links then System X and/or System Y will migrate their feeder link operations out of the lower Transit Band, and ORBCOMM and Starsys will migrate their feeder link operations into the lower Transit Band.

Attachment A

E-SAT Spectrum Use Plan

Uplink 148-150 MHz Band

E-SAT will use a Direct Sequence Spread Spectrum technique over a 1.4 MHz bandwidth. This band will be from 148.450-149.900 MHz.

Downlink 137-138 MHz Band

This link will be a Direct Sequence Spread Spectrum technique over a 1 MHz bandwidth. This band will be from 137-138 MHz.

Interference

1. Narrowband users

E-SAT's power flux density (pfd) in both the space-to-Earth and Earth-to-space directions will be below the receive threshold of narrowband users of the band. Because E-SAT will operate with a pfd of -158 dBW/m^2/4kHz (downlink-measured on the ground), and -161 dBW/m^2/4kHz (uplink - measured in space), narrowband users of the band will not be able to detect the E-SAT signal.

2. Spread-spectrum users

E-SAT will use an opposite circular polarization from Starsys and will use different CDMA code strings to allow co-frequency sharing. In the case of the uplink, E-SAT's center frequency (149.175) will be offset from the center frequency of Starsys. E-SAT will pick a code set that is orthogonal to that used by Starsys in both uplink and downlink.

E-SAT will not operate co-frequency with S-80.

Concerns have been raised that E-SAT's use of uplink frequencies (148.905 to 149.900 MHz) may effect the operation of some DCAAS systems utilized by TDMA/FDMA operators. Several operators have proposed a DCAAS design, not yet operable, which E-SAT has addressed with several possible solutions. E-SAT will continue coordination with these operators as they complete their monitor design characteristics.